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Parameterization in labeling: Evidence from child language

Abstract: This paper examines very early child grammars from the minimalist perspective. It discusses the well-known erroneous strings very young children produce such as Root Infinitives in English and their Japanese counterparts, preverbal object sentences in English, and sentences without Case markers in Japanese. The main question to be addressed is whether those sentences children produce are labeled, and if so, how the labeling takes place. Assuming that ϕ-feature agreement and suffixal Case markers play crucial roles for labeling in English and Japanese respectively (Chomsky 2013; Saito 2016), I consider two possibilities. One is that children are equipped with those almost from the outset although they are not phonetically realized. This means that even the erroneous strings children produced are properly labeled. The other is that those strings are not labeled in the adult way and that children at the relevant stage are still in the process of figuring out how the {XP, YP} structure is labeled in their respective languages. I argue that the latter is a viable possibility, given the parameterization in the labeling mechanism, and receives support from the child data as well. This conclusion implies that a main part of the acquisition of syntax is for a child to discover how her/his target language labels the {XP, YP} structure.

Keywords: language acquisition, two-word stage, scrambling, labeling, merge, root infinitives, root infinitive analogues

1 Introduction

In Chomsky's (1994, 2013) minimalist approach to syntax, Merge is proposed as the most fundamental operation that combines two elements, α and β, into a constituent containing α and β. This operation accompanies a Labeling Algorithm (LA) that specifies the nature of the formed object, and it is this LA that largely dictates the distribution of nominal phrases and the application of movement (Internal Merge). Chomsky (2013) argues, in particular, that a finite clause is labeled through the sharing of ϕ-features between the subject

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DP and T, and that this is the reason a language requires φ-feature agreement. Saito (2016), on the other hand, suggests that suffixal Case markers make it possible to label finite clauses in Japanese, a language that lacks φ-feature agreement.

The hypotheses on labeling mentioned above make a number of desirable predictions on the grammars of languages with and without φ-feature agreement. At the same time, they raise interesting questions on the acquisition process that children go through. For English, for example, it is observed that children go through stages where Tense and agreement are omitted and where they are only optionally realized. The former is known as the pre-functional Root Infinitive (R-I) stage and the latter is known as the optional R-I stage. It is reported in Murasugi and Fuji (2008) among others that Japanese-speaking children go through a similar stage where the past tense form of the verb is employed as the surrogate root infinitive. At this stage, children's utterances do not contain Tense or Case markers.

Then, how are children's "sentences" labeled without φ-feature agreement in English and without Case markers in Japanese? Do children employ LAs that are distinct from adults? Or do they produce "sentences" without labels? This is the main question that this paper addresses. After presenting the specific problems that arise with children's grammars, I suggest that a main part of the acquisition of syntax is setting the parametric value of the mother tongue with respect to the labeling of {XP, YP} structure. This is consistent with the proposal mentioned above that the necessity of labeling is universal but the locus of language variation is in the way in which labels are provided.

In the following section, I briefly explain Chomsky's (2013) LA, and then, Saito's (2016) proposal on labeling in languages without φ-feature agreement. In Section 3.2, I discuss child English data from two-word stage and the R-I stage and the problems they raise. Section 3.3 concerns similar data from child Japanese. It is demonstrated that they lead to the same problems. In Section 4, I suggest that those data reflect the process of setting the parametric value of labeling and acquiring the LA of the target language.

2 Labeling in phrase structure

One of the fundamental questions in Minimalist syntax is why Language has φ-feature agreement and Case, which seem redundant for interpretation. Chomsky (2008, 2013) pursues this question. He assumes first that Language must

minimally have the operation Merge, which forms a constituent of two elements as in (1).

(1) $\alpha, \beta \rightarrow \gamma = \{\alpha, \beta\}$

Chomsky (2008), for example, maintains that Case features on DPs are valued as reflections of φ-feature agreement. This is illustrated below.

(2)   a. She sees us
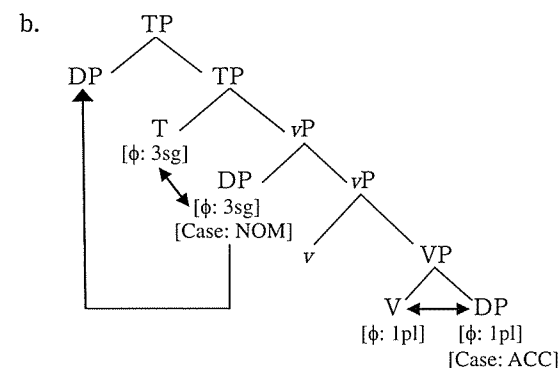
The structure is formed by Merge, as VP = {V, DP}, vP = {v, VP} and so on. ↔ indicates an Agree relation. V agrees with the object DP and obtains its φ-feature values. As a reflection of this, the Case feature of the object is valued accusative. The same process is observed between T and the subject DP. The agree relation yields the valuation of the φ-feature values of T as 3rd person singular and the Case feature of the subject as nominative.[1] The subject DP internally merges with the TP.

Merge is assumed to accompany a Labeling Algorithm (LA). The idea is that the nature of the syntactic object it forms must be specified. For example, the interpretive components need to know whether γ = {D(P), V(P)} is verbal (VP) or nominal (DP). Chomsky (2013) presents a concrete proposal for the algorithm. It is summarized in (3).

(3)   a. α determines the label of γ = {α, β} if
       (i) α is a head and β is a phrase or (ii) γ fully contains α but not β.

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1 Chomsky (2008) assumes that unvalued φ-features originate in phase heads C and v and are inherited by T and V. The Agree relations are thus between T and the subject DP and between V and the object DP.

b. The label of $\gamma = \{\alpha, \beta\}$ is $<$ F, F $>$ if
    α, β are both phrases and their heads share a significant feature F.

Let us use the structure in (2) to illustrate this. The structure is built bottom-up. {V, DP} and then {v, VP} are formed, and they are labeled straightforwardly as they contain unique heads. The next phase, {DP, vP}, is also labeled because it fully contains only vP after DP moves out of it. The movement is in fact necessary for this phrase to be labeled. After {T, vP}, the matrix clause, {DP, TP}, is constructed. (3b) comes into play at this point. The two constituents share the same ɸ-features because of ɸ-feature agreement. The clause is labeled as $<\phi$, $\phi>$. This analysis captures the fact that NP-movement always creates an {XP, YP} configuration (i.e. is always to a specifier position in old terminology), and continues to apply until the DP reaches a position of ɸ-feature sharing (i.e. a position of specifier-head ɸ-feature agreement in old terminology).

The LA in (3) provides an answer to the question why there is ɸ-feature agreement in Language. The structure created by Merge needs to be labeled. And a finite sentence can be labeled because of ɸ-feature agreement. This raises an interesting question for languages like Japanese, which lack ɸ-feature agreement at least on the surface. How are sentences labeled in these languages? This is the problem that Saito (2016) addresses.

Saito (2016) first adopts Bošković's (2007) proposal that Case feature valuation (between T and DP, and V and DP) takes place independently of ɸ-feature agreement, as in (4).

(4)
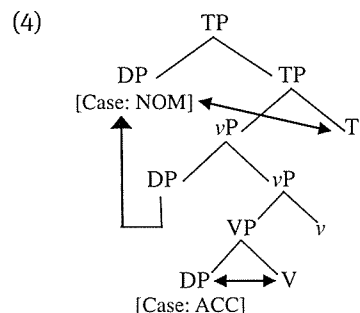
T values Case of the subject and V values Case of the object regardless of whether there is ɸ-feature agreement between the Case-assigning head and the DP.

Then, he proposes that suffixal Cases in Japanese serve as anti-labeling devices. That is, in the configuration in (5), βP provides the label for the constituent.

(5) $\gamma = \{\alpha P\text{-Case}, \beta P\}$, where Case is suffixal.

This proposal accounts for the labeling not only of simple tensed clauses but also of multiple nominative subject sentences, instantiated by (6) from Kuno (1973).

(6)   [$_{TP}$ Bunmeikoku-ga   [$_{TP}$ dansei-ga [$_{TP}$ heikin-zyumyoo-ga
        civilized.country-NOM   male-NOM   average-life.span-NOM
        [$_{TP}$ mizikai]]]]
        short
        'It is in civilized countries that it is the male population whose average life-span is short.'

As the subjects accompany the nominative Case marker -*ga*, their sister TPs provide the label for $\gamma = \{DP\text{-}ga, TP\}$. The proposal also explains why scrambling is possible in the language. In (7), the matrix clause is labeled by the lower TP because the scrambled object accompanies the accusative Case marker -*o*.

(7)   [$_{TP}$ Sono hon-o   [$_{TP}$ Taroo-ga   __ katta]] (koto)
        that   book-ACC   Taroo-NOM   bought fact
        '(the fact that) Taroo bought that book'

If the proposals illustrated above are correct, ɸ-feature agreement is indispensable for labeling in English, and Case markers play crucial roles for labeling in Japanese. However, children go through acquisition stages where ɸ-feature agreement and Case markers are missing in their production. This raises interesting questions on the grammars they have at these stages. I discuss the relevant facts in the following section.

3 The production at early stages

In this section, I briefly discuss the relevant production data from English in Section 3.2, and then present parallel facts from Japanese in Section 3.3. But before this, I consider the early setting of the head parameter in Section 3.1, which is observable already at the two-word stage.

3.1 Wexler's (1996, 1998) very early parameter setting

It has been known that children's word order largely adheres to the adults' even at the two-word stage. For example, Okubo (1967), assuming Braine's (1963) pivot-open grammar, provides evidence for this in her comparative study of two-word utterances in English and Japanese. Some examples from Okubo (1967: 32) are shown in (8) and (9).

(8) a. there book
     b. give candy
     c. Bambi go
     d. big boat
     e. no wet
     f. no wash

(9) a. outi   koko
         house here
     b. ame   tyoodai
         candy give.me
     c. Buun   itta-mon
         airplane went-PARTICLE
     d. ookii basu
         big   bus
     e. oitii   nai
         yummy no
     f. kaero nai
         return no

The positions of the locative predicate, object, subject, prenominal adjective and negation are all consistent with adult grammar.

It is not totally clear how children fix the word order at two-word stage. However, the data are consistent with Wexler's (1998) proposal that some parameters are set quite early. He shows that the adult word order of head-complement is displayed by very young children, and argues that the head parameter is set correctly at the earliest observable stage, that is, at the time they enter the two-word stage. Supporting evidence for this proposal has been provided in acquisition studies on other languages such as French, Dutch and German (see Weissenborn 1990; Pierce 1992; Poeppel and Wexler 1993, among others.)

Wexler's proposal implies that children already assume the head-complement relation at two-word stage. This in turn means that they should have no

problem labeling a phrase consisting of a head and a complement if the part of (3) shown in (10) is innate, as seems plausible.

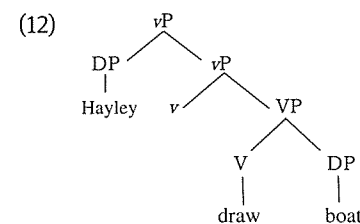(10) If $\gamma = \{H, YP\}$, then H provides the label of γ.

The issue then is how children deal with the labeling of $\gamma = \{XP, YP\}$ when they start producing them.

3.2 The root infinitive stage in English

Syntactic deficits are found at around the stage of two-word utterances through early multi-word utterances. Among the most widely known is the Root Infinitive (R-I) phenomenon. It is a well-documented fact that very young children sometimes use non-adult infinitives in root contexts, omitting auxiliaries and determiners, and erroneously Case-marking the subject, as shown in (11). (11a-d) are from Radford (1990) and (11e) from Galasso (1999).

(11) a. Adult: What did you draw?
         Child: Hayley draw boat (1;08)
     b. Adult: What did you do in your new bed?
         Child: Jem get in (1;08)
     c. (*e*) Kick ball (1;10)
     d. Me kick (2;06)
     e. Daddy go (1;10)

In order to explain the possible clausal structure that children may assign to such utterances as (11), Radford (1990) proposes the Small Clause Hypothesis (henceforth, SCH). The idea is that very young children do not have functional categories, and that the structure is like small clause in adult grammar. According to SCH, the child utterance in (11a) has the structure in (12).

(12)

```
            vP
          /    \
        DP      vP
        |      /   \
      Hayley  v     VP
              draw  /  \
                   V    DP
                   |    |
                 draw  boat
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This immediately raises the question if this structure is labeled, and if so, how.

There is some evidence reported that may weaken the SCH. For example, Harris and Wexler (1996) argue that English-acquiring children, for example, distinguish lexical verbs and auxiliaries, and know that lexical verbs do not move overtly to Tense whereas auxiliaries do. One piece of evidence for this is that they never produce sentences where a main verb is moved past the negation (e.g. *John eats not*), while they do produce such sentences as *I can't see you* (Eve 1;10) and *I don't want soup* (Eve 1;11). If auxiliaries move to Tense, then the children must be assuming Tense as a head in the structure. Radford (1996), however, argues that children do go through a small clause stage, where they never employ functional projections, based on the fact that Nathalie, a French-acquiring child (1;09), uses only infinitive verbs and does not display knowledge of Tense.

Galasso (2001) extends Radford's analysis in a way that answers Harris and Wexler's (1996) objection. He argues that there are two stages in the acquisition of functional categories: the pre-functional stage and optional infinitive stage. The former is the SCH stage. At this stage, children's utterances contain Caseless nominals and infinitival verbs as in (11). In the optional infinitive stage that follows, children's utterances optionally contain T and C sometimes with their features underspecified. The proposal basically says that there are two phases of R-I stage, i.e. a period when all verbs produced are non-finite and one when the verbs produced are optionally finite. The prediction is that the movement of auxiliary verbs to Tense is observed in the latter. The problem of labeling illustrated in (12) remains under this analysis.

If one denies SCH and assumes that children always postulate functional categories including Tense, then it becomes possible to entertain the hypothesis that the sentences they utter are labeled in the same way as in adult grammar. The peculiarity of the utterances in (11) is due to the failure to phonetically realize φ-features on Tense and Case features on DPs properly. Schütze and Wexler (1996) in fact present a model that can be interpreted this way, i.e. their Agreement/Tense Omission Model (ATOM). According to this model, there is a stage of development (R-I stage) during which the features of Tense (including the φ-features) may be underspecified. This results in children optionally using non-finite verb forms in contexts in which finite verb forms would be obligatory in adult grammar, and producing erroneous strings such as those in (13).

(13) a. That go in there
      b. Daddy going to the shops
      c. Mummy gone to work

ATOM explains in addition, Schütze and Wexler argue, the Case "errors," observed in (11d). In more general terms, children sometimes use non-nominative pronouns such as *me, my, him* and *her* in contexts in which nominative pronouns are required, as shown in (14). (See Gruber 1967; Brown 1973; Rispoli 1994, Rispoli 1999; Wexler 1998, among many others.)

(14) a. My go in there
      b. Me went home
      c. Him going to the shops
      d. Her gone to work

This type of "errors," according to Schütze and Wexler, are related to the deficiency of the feature specification of Tense or failure to phonetically realize the Case feature value properly.

Although it remains a possibility that children at the R-I stage postulate abstract T with unvalued φ-features and successfully label R-I sentences as $<φ, φ>$, this does not seem to be viable unless φ-feature agreement is a universal property of human language that is encoded in UG. As noted above, there are languages like Japanese that lack φ-feature agreement. Further, the absence of Tense and erroneous Case are not the only phenomena observed in the R-I stage. During this stage, the subject not only can be erroneously Case-marked but also can be null. And interestingly enough, when the subject is missing, the object sometimes appears in front of the verbal element as if the object is scrambled to the sentence-initial position. Radford (1990), for instance, cites Bowerman (1973) and reports that Kendall, just before two years of age, produced verb phrases in both Verb-Object (henceforth, VO) order as in (15) and Object-Verb (henceforth, OV) order as in (16).

(15) a. Look Kendall (VO)   (1;10-1;11)
         'Look at Kendall'
      b. Writing book (VO)   (1;10-1;11)
      c. Break Fur-Book (VO)   (1;10-1;11)
            name of book
      d. Bite...finger (VO)   (1;10-1;11)

(16) a. Doggie sew (OV)   (1;10-1;11)
         'Sew a doggie'
      b. Kimmy kick (OV)   (1;10-1;11)
         'Kick Kimmy'

c. Kendall pick-up (OV)   (1;10-1;11)
   'Pick up Kendall'
d. Doggie lookit (OV)   (1;10-1;11)
   'Look at the doggie'

Radford (1990: 249) further states that the same pattern is found with structures containing both an overt subject and an overt complement. The order Subject-Verb-Object (e.g. *Mommy... sew doggie*) and the order Object-Verb-Subject (*Mommy hit Kendall,* meaning Kendall hit(s) Mommy) are both found.

The OV order in children's utterances is in fact well documented. The following examples are among those found in the literature[2]:

(17) a. Book read (meaning 'read book') (Susan 1;10)
          (Miller and Ervin 1964)
      b. Balloon throw (meaning 'throw balloon') (Gia 1;07)
          (Bloom 1970: 86)
      c. Paper find (meaning 'find paper') (Adam 2;03)
          (Brown et al. 1968)
      d. Paper write (meaning 'write paper') (Adam 2;03)
          (Brown et al. 1968)
      e. Pencil put mouth (meaning 'put pencil in mouth') (Adam 2;04)
          (CHILDES: BROWN: aDAM03.CHA)
      f. Door push in (meaning 'push door in') (CHI 1;10)
          (CHILDES: VALIAN: 04C.CHA)
      g. Kimmy change here (meaning 'change Kimmy here') (Kendall 1;11)
          (CHILDES: BRAIN: KENDALL1.CHA)

This word order variation is significant especially because the head parameter is set quite early as discussed above. Radford (1990: 70–72) himself observes that the word order in PPs, for instance, is adult-like at the stage where functional categories are missing. He states that children clearly "know" from a very young

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2 (17e-g) are from Koizumi (1999: 231). He presents these and other Child language data as evidence for his split VP hypothesis, where the heads in the clausal spine are assumed to be AGR_S-T-v-AGR_O-V. It is assumed that the object moves to AGR_O Spec and V raises to AGR_O and then to v in adult English, yielding the VO order. His analysis for (17e-g) is that they are truncated AGR_OPs. As V does not move to v but stays at AGR_O, the object precedes the verb. I do not discuss this analysis in the text because it is not consistent, for example, with the assumption that the ɸ-features to be valued by the object originate in v. (See Footnote 1.) But the reader is referred to Koizumi (1999) for insightful discussion on relevant child data not only in English but also in French.

age that P can be projected to P-bar by the addition of a complement just like N and V. His examples are shown in (18).

(18) a. Paula play with ball. In there, mummy. Put in there. Go in there. Hat on baby.
      b. Paula play with ball. Open box. Go in. Get out.   (Paula 1;06)

The head Ps in (18a), *with, in* and *on*, are placed before their complements just like the head Vs of VPs in (18b). In this case, the word order is strict. No PO-OP alternation is observed in contrast with VO-OV.

If the children that produce the OV examples in (16) and (17) already set the head parameter as head-initial, then those examples are derived by preposing the object with a scrambling-like movement operation. And this is not expected under the assumption that children at this stage have the adult grammar with functional categories and ɸ-feature agreement. The adult grammar of English does not allow the OV order. The task, at this point, is then to characterize the early child grammar that exhibits the R-I phenomenon, "erroneous" Case realization, and occasional OV order. I discuss this problem from a comparative perspective in Section 4 after I present relevant acquisition data from Japanese in the following subsection.

3.3 Root infinitive analogues in Japanese

It was shown in the preceding subsection that the R-I stage in English poses an interesting problem concerning labeling in child grammar. I turn to the acquisition process of Japanese in this subsection. I show that Japanese-speaking children go through a similar R-I analogue stage and that the same problem arises with their grammar at that point. At the end, I briefly introduce Kim and Phillips's (1998) discussion of R-I analogue stage in Korean, which describes the phenomenon from a slightly different angle but points to the same conclusion.

The R-I phenomenon is observed in various languages, and it is reported that it exhibits the properties in (19). Many of those properties are adopted from Deen (2002).

(19) a. R-Is are non-finite verbs in root contexts.
      b. At the R-I stage, no T-related/C-related items are found.
      c. R-Is are produced to describe events in real time, that is, as an on-going activity in the past, present, or future that the child is involved in.

d. R-Is occur in modal contexts (the Modal Reference Effects - MREs).
e. R-Is are restricted to event-denoting predicates (the Eventivity Constraint).
f. Head Merger is not available during the R-I (analogue) stage.
g. The subject may be null, erroneously Case-marked, or misplaced at the non-sentence-initial position.

The tense- and complementizer-related items do not co-occur with R-Is or non-finite verbs. This is observed in many European languages as noted in Rizzi (1993/1994) and Wexler (1994). And R-Is are sometimes produced to express children's intention, desire or volition in various irrealis modal-contexts, which is termed the Modal Reference Effects (MREs) (Hoekstra and Hyams 1998). R-Is are also produced to describe events in real time, i.e. on-going activities in the past, present or future that the child is involved in. (19f) is based on Phillips's (1995, 1996) proposal that two-year-old children's R-I clauses lack the derivational step that would combine the verb with inflection.

Murasugi et al. (2007), Murasugi and Fuji (2008), Murasugi et al. (2009), Murasugi (2015), among others, examine the R-I analogue stage in Japanese, on the basis of analysis of the Sumihare corpus (Noji 1973–1977) and longitudinal studies with three Japanese-acquiring children. Some relevant data from Noji (1973–1977) are shown in (20).

(20) a. atti. atti. atti i-ta.   (1;06) (irrealis/volition, adult form: *ik-u*, or *ik-e*)
        there there there go-PAST
        'I want to go there / Go there.'
     b. tii   si-ta.   (1;07) (irrealis/volition, adult form: *si-ta-i*)
        mimetics (pee) do-PAST
        'I want to pee.'

Murasugi et al. (2007) and Murasugi and Fuji (2008), among others, argue that (i) there is a R-I analogue stage in Japanese, which corresponds to the R-I stage in other languages,[3] (ii) the verb form in question is the past-tense form V-*ta* as shown in (20), (iii) the stage is found much earlier than the so called the optional infinitives, i.e. even at one year of age, or at the pre-functional stage, and (iv) the properties given in (19) are found for the Japanese R-I analogues.

The nominative Case marker -*ga* does not appear, and rich conjugation does not take place with adjectives and verbs at the stage in question.

Noji's (the observer) notes on Sumihare's utterances are very informative. He writes that *i-ta* in (20a) means *ik-u* (go-PRES) and that Sumihare used the form *i-ta* because he could not say *ik-u* (Noji 1973–1977, I:195).[4] Noji also writes an important comment for (20b), which convinced us of the Modal Reference Effects at the early stage of Japanese acquisition. According to him, Sumihare used *tii-si-ta* when he wanted to pee, that is, in a volitional context.

The development of a predicate can be illustrated with *tii si-ta* in (20b). *Sii* or *tii* is a mimetic, and it is used bare initially as in (21a). It is then followed by *si-ta* 'did' as in (21c).

(21) a. sii   (Sumihare 1;02)
        pee
        '(I) pee.'
     b. sii-ta   (Sumihare 1;05)
        pee-PAST
        '(I) peed.'
     c. tii   si-ta-na   (Sumihare 1;07)
        pee do-PAST-PARTICLE
        '(I want to) pee.'
     d. tii   tyoodai (Sumihare 1;09)
        pee give.me
        'Let me pee.'

V-*ta* form is used to refer to a past event as in (21b), but it is employed in volitional and imperative contexts also, as exemplified in (21c). Before the non-past tense and other conjugations of the verb appear, -*tyoodai* 'give-me' comes to be used as well in a volitional context.

R-I analogues in Japanese tend to have a null subject. But unaccusative verbs such as *kita* 'came' and *otita* 'fell' often appear with an overt subject, as Murasugi and Fuji (2008) point out. Let us take *kuru* 'come' to observe the development of Case, starting at the R-I analogue stage. Sumihare keeps using the form of *kita*, optionally realizing the "subject nominal" without a Case marker from 1;06 until around 1;10. This is illustrated in (22a-d).

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3 Our results are consistent with Sano (1995) and Kato et al.'s (2003) observation that erroneous non-finite verbs are not found with two-year-old Japanese-speaking children. The R-I analogue stage reported here is earlier.

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4 The context for (20a) is the following: Sumihare's father (Noji, the observer) went out for a walk with Sumihare on his back. He tried to get back home, but Sumihare pointed to a different direction and produced a bare adverbial "atti (there)" twice. Then, Sumihare, again, got frustrated and produced a V-*ta* form, "atti *i-ta* (there go-PAST)" angrily.

(22) a. kita   kita   kita   (Sumihare 1;06)
         came came came
         'A bicycle came by.'
      b. rinrin   kita   (Sumihare 1;06)
         bicycle came
         'A bicycle came.'
         [Simihare watches a bicycle coming by, and he tries to run away.]
      c. ringo   kita   (Sumihare 1;06)
         apple   came
         'A man selling apples came by.'
      d. wanwan kita   kaatyan (Sumihare 1;10)
         doggie   came   Mother
         'A doggie came, Mother.'
      e. xxx-ga   kita   yo.   kuru   yo   (Sumihare 2;0)
         ... -NOM came PARTICLE come PARTICLE
         '(Something) is coming.'
      f. wakame wakame ozityan-ga kuru   (Sumihare 2;01)
         seaweed seaweed man-NOM   comes
         'A man selling seaweed is coming by.'
         [Sumihare tells his mother that the man selling seaweed is coming by.]

It is only at around 2;0 that he starts to attach the nominative Case marker consistently on the subject.[5] It is around this time that he starts using the non-past tense form *kuru* productively. This correlation is expected because Tense values nominative Case.

Note here that the lack of head merger, which was originally pointed out by Phillips (1995, 1996) as one of the properties found during the R-I stage, is also observed in the Japanese R-I analogue stage.[6] The negative morpheme *-na-* attaches to a verb stem and itself takes a tense suffix as in *ko-na-i* 'come-not-NON.PAST'. While *nai* appears as an independent word before 2;0 of age as shown in (23a), it is only after then that Sumihare produces an adult-like form as in (23b).[7]

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5 Okubo (1967) also notes that nominals are not Cases-marked at the two-word stage, and that it is only after 2 of age that arguments come to be consistently Case-marked. Similar findings are reported by other psycholinguists as well. Miyahara and Miyahara (1973), based on their long-itudinal study with a Japanese-acquiring child, note that there are no Case markers used at the two-word stage.

6 See Murasugi and Fuji (2009) for more detailed discussion.

7 Some types of sentence-final discourse particles such as *yo*, *ne* and *na* are observed in the R-I analogue stage as in (23a). This is not surprising because they attach not only to TPs but to

(23) a. Chimbun   kita   nai yo   (Sumihare 1;11)
         newspaper came not PARTICLE
         'The newspaper is not delivered.'
      b. Tootyan shuppopo konai   (Sumihare 2;01)
         father   train   come-not-NON.PAST
         'Daddy, the train has not arrived.'

It is important for the purpose here that a subject occasionally appears with verbs that take an external argument in the R-I analogue stage. And the subject is not Case marked in this case, either. Two examples are given in (24).

(24) a. Buu   maimai-ta   (Sumihare 1;10)
         airplane go-around-PAST
         'The airplane goes around in the air.'
      b. Akatyan memeet-ta (Sumihare 1;10)
         baby   eye-PAST
         '*Lit*. The baby eyed. Intended meaning: The baby opened his eyes.'

In (24a), an airplane flies in the air, and in (24b), a baby opened his eyes. The structure of (24a), for example, would be as in (25).

(25)
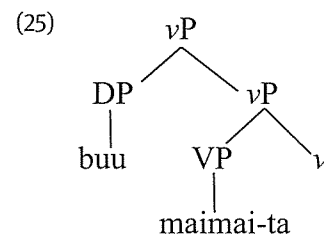
As no Case marker appears at this stage, a question arises whether the whole structure is labeled and if it is, how, exactly as in the case of English example in (12).

The same problem seems to arise with Korean, a language that shares many features with Japanese with respect to labeling. Kim and Phillips (1998) report that a Korean-acquiring child used the default mood marker *-e*, which is sometimes

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phrases of any category, including DPs. As sentence-final particles, they follow TPs and CPs in adult speech. Their appearance in the R-I analogue stage indicates then that the acquisition of phrase structure does not take place strictly in a bottom-up fashion.

phonetically realized as -*a*, in imperative, declarative and interrogative sentences in the adult way at around the age of two as shown in (26).

(26) a. mul   cwu-e   (2yrs)
      water   give-IMPERATIVE
      'give water'
   b. i   tak-e   (2yrs)
      teeth   brush-DECLARATIVE
      '(I'm) brushing the teeth.'
   c. enni   ka-(a)   (2yrs)
      sister   go-QUESTION
      'Did sister go?'

However, the child also used the form in some ungrammatical contexts at 2;02 through 2;03, as shown in (27).

(27) a. *mek-e   emma   (2 yrs)   (adult form: *mek-ca* (PROPOSITIVE))
      eat-DECLARATIVE mommy
      'Let's eat, Mommy.'
   b. *ayki   pwo-a   (2 yrs)   (adult: *pwo-l-kkeya* (PRESUMPTIVE))
      baby   look-DECLARATIVE
      'Baby (I) will look at it.'

In (27), the default mood marker -*e (-a)* is "erroneously" used in contexts where the specific propositive marker -*ca* and the presumptive marker -*l-kkeya* should be employed in adult Korean.

     Kim and Phillips (1998) analyze the V-*e* form as a R-I analogue form, as the sentences containing the verbal form bear some typical R-I (analogue) properties. First, the V-*e* form is not marked for tense at a very early stage. In adult Korean, the tense morpheme -*ess* is obligatory to express completive events as the contrast between (28a) and (28b) indicates. The Korean-acquiring child, however, did not use the past-tense morphemes even in the obligatory contexts from 2;02 through 2;03, as exemplified in (29).

(28) a. mek-ess-ta   (Past)
      eat-PAST-DECL.
      'I ate.'
   b. mek-e   (Present)
      eat-DECL.
      'I eat.'

(29) enni   ka-Ø-(a)   (2 years)
     sister   go-(PAST)-(QUESTION)
   'Intended meaning: Did sister go?'

Second, the V-*e* form did not co-occur with a nominative Case marker, a tense-related item, in the child utterances. In adult Korean, nominative Case markers can be dropped in discourse-licensed contexts as in (30a), but this is not totally free. For example, they cannot be omitted in scrambled sentences as shown in (30b).[8]

(30) a. emma-(ka)   pap-ul   mek-ess-e   (SOV)
      mom-NOM   meal-ACC   eat -PAST-DECL.
      'Mommy ate the meal.'
   b. pap-ul   emma-*(ka)   mek-ess-e   (OSV)
      meal-ACC   mom-NOM   eat-PAST-DECL.
      'Mommy ate the meal.'

The child, however, dropped a nominative Case marker even in scrambled sentences and other obligatory contexts. According to Kim and Phillips (1998), her mother used the nominative Case marker 50% of the time in discourse-licensed contexts and 96% in the grammatically required contexts. On the other hand, the child used it in only 1% of the time in discourse-licensed contexts and 0% in grammatically required contexts.

     Kim and Phillips (1998) is a study clearly showing that children go through a R-I analogue stage where the default form of the verb is employed as the surrogate root infinitive and utterances do not contain Tense or Case markers. Then, how are children's "sentences" labeled without ϕ-feature agreement or suffixal Case markers? (27b), for example, poses exactly the same problem as Japanese (25). Its structure is shown in (31).

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8 "Case marker drop" in Korean and Japanese seems to be a complex phenomenon. Kuno (1973) proposes that nominative Case markers cannot be omitted and that bare subjects are topics in Japanese. Saito (1983) discusses accusative Case marker drop and suggests the generalization that it is allowed only when the object is adjacent to the verb. These proposals go well with the labeling mechanism assumed here, but a number of works, including corpus studies, have appeared since, presenting a large data base. It remains to be seen whether the original generalizations can be maintained.
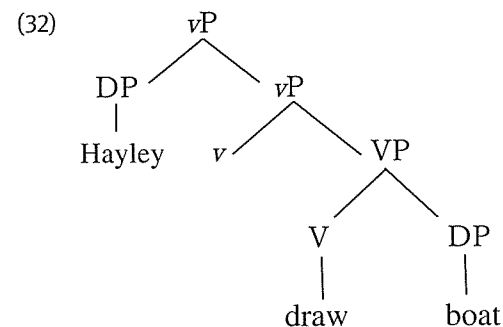
(31)

```
         vP
        /  \
      DP     vP
      |     /  \
     ayki  VP    v
           |
         pwo-a
```
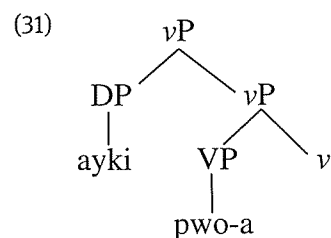
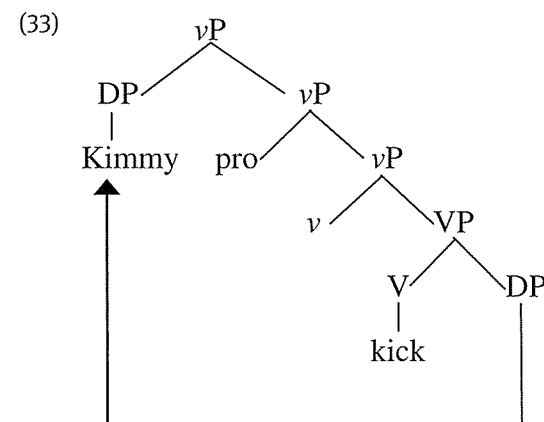It is not clear whether and how this structure is labeled.

4 Two-word stage and R-Is reanalyzed in the minimalist program

It was seen in the preceding section that English-speaking children and Japanese/Korean-speaking children both go through (surrogate) R-I stages and that questions arise with respect to the labeling of sentences at these stages. In this section, I consider two possibilities. One, which I eventually reject, is that they basically have adult grammar of some form either with abstract φ-feature agreement or with null suffixal Case markers. The other is that children are still trying to figure out how labeling of {XP, YP} structures is achieved in their languages during the stages in question. I suggest that this second possibility makes sense from cross-linguistic perspective.

Recall Galasso's (2001) proposal that English-speaking children go through two early stages. First, their sentences are small clauses as proposed by Radford (1990). Then, they employ Tense but only optionally in the typical R-I stage. If this is correct, they allow structures as in (12), repeated in (32).
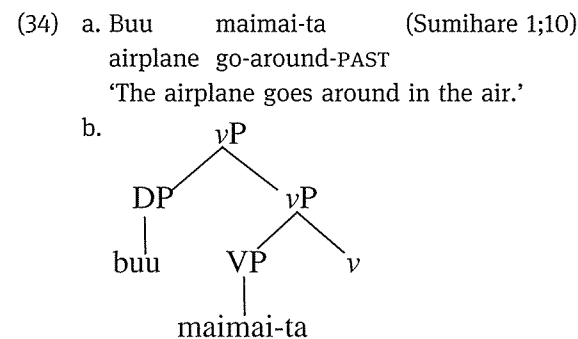
(32)

```
          vP
         /  \
       DP     vP
       |     /  \
     Hayley v     VP
              /  \
            V      DP
            |      |
          draw   boat
```

In addition, object "scrambling" is observed around the time. The structure of (16b) is plausibly as in (33).

(33)

```
              vP
             /  \
           DP     vP
           |     /  \
        Kimmy  pro    vP
                     /  \
                    v     VP
                        /  \
                      V      DP
                      |
                     kick
```

In both (32) and (33), the issue is whether the whole structure is labeled and if so, how.

The same problem arises with Japanese. The hypothesis entertained above is that the utterance in (24a), repeated below in (34a), has the structure in (34b).

(34) a. Buu   maimai-ta   (Sumihare 1;10)
      airplane go-around-PAST
      'The airplane goes around in the air.'

   b.

```
          vP
         /  \
       DP     vP
       |     /  \
      buu   VP    v
            |
        maimai-ta
```

The question is how this structure is labeled.

One possibility that immediately comes to mind is that children at the R-I (analogue) stage, both English-acquiring and Japanese-acquiring, have an adult-like mechanism for labeling. Let us first consider the possibility once again that Radford's (1990) small clause hypothesis is wrong and that R-I sentences in English are TPs with abstract T and φ-feature agreement. This would make the

labeling of regular R-I sentences possible but does not straightforwardly extend to the OV examples as in (33). In addition, if children assume abstract φ-feature agreement because it is part of UG, i.e. their innate endowment, then Japanese-speaking children must assume it as well. But then, it is unclear how they "unlearn" this and arrive at the adult grammar of Japanese.[9]

Suppose then that English-speaking at the R-I stage has the adult Japanese grammar with null suffixal Case markers for arguments. This would make it possible for (32) to be labeled, and further, predicts that English-speaking children allow scrambling as in (33). However, this hypothesis encounters a learnability problem. If English-speaking children assume null suffixal Case, how do they discover that the assumption is wrong? The fact that English allows neither multiple nominative subjects nor scrambling would lead to the desired conclusion. But this would require negative evidence. A similar learnability issue arises with this hypothesis when it is applied to Japanese-speaking children in the surrogate R-I stage. If they successfully label (34) because they assume null suffixal Case, how do they discover that suffixal Case markers cannot be null, at least in contexts where they are grammatically required? This too would require negative evidence.

Given the hypothesis that tensed clauses are labeled differently in English and Japanese, a more plausible possibility seems to be that children must go through a stage when they try to discover the labeling mechanism of their target language. Merge is a necessary part of a language, and it requires that every constituent be labeled. It is also universal that the head determines the label of a head-complement structure, {H, XP}.[10] However, the way an {XP, YP} structure is labeled can vary among languages, according to the discussion in Section 2. Chomsky (2013) proposes that a tensed clause in English, {DP, TP}, is labeled <φ, φ> because D and T share the same φ-features. This is made possible by φ-feature agreement. Saito (2016), on the other hand, suggests that the same structure in Japanese, {DP-NOM, TP}, is labeled by TP because suffixal Case markers in the language function as "anti-labeling devices." If this variation indeed exists, a

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9 The hypothesis entertained above for Japanese only states that labeling is achieved in the language without φ-feature agreement. Then, it leaves room for the possibility that the language has it somewhat redundantly. But Takahashi (this issue), for example, argues that the language allows argument ellipsis because of the absence of φ-feature agreement. This implies that the language not only need not but cannot have φ-feature agreement. Further, it is difficult to imagine that argument ellipsis, a very delicate phenomenon, serves as evidence for children to abandon the initially assumed φ-feature agreement.
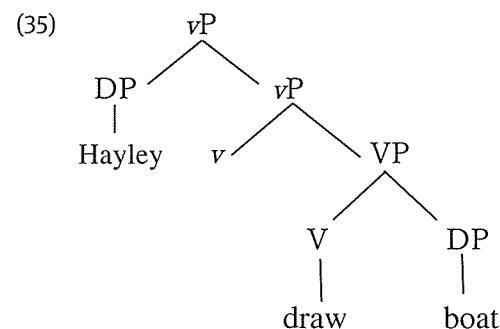**10** Chomsky (2015) proposes that there are weak heads, for example, T in English, that cannot contribute to labeling. If one adopts this, the statement in the text holds for strong heads.

child must acquire the knowledge, on the basis of experience, on how her/his language accomplishes the labeling of {XP, YP} structure.

The acquisition of labeling of tensed clauses becomes possible only after Tense is introduced into the clausal structure as a head, in both English and Japanese. If there is a small clause stage, as Radford (1990) proposes, then there is no φ-feature agreement between Tense and the external argument at this stage. In Japanese, the external argument cannot appear in nominative because there is no Tense in the structure to value this Case. Recall here that consistent nominative marking of the subject and the emergence of Tense in the structure roughly coincide. Then, the development of children's grammar starting with the R-I (analogue) stage can be viewed as a process of acquiring how labeling of {XP, YP} is accomplished in the target language. If this is correct, it is conceivable that the Labeling Algorithm (LA) is still partially under construction during this period.

The pre-functional R-Is and Japanese/Korean-type R-I analogues have the truncated structure above vP. Thus, {DP, vP} is not labeled. Since T is not present, there is no valuation of Case or φ-features. Later, optional R-Is show up in the intermediate stage where children are testing the applications of (3b) proposed by Chomsky (2013). Although the optional R-I stage is well attested in European languages, it is not obvious in Japanese. This may be because there is much evidence (such as scrambled sentences, multiple subjects, and phonetically realized suffixal Case) available in the primary linguistic data that leads children to adopt (5) proposed by Saito (2016).

The speculation above raises new questions. If children are still trying to figure out how clauses are labeled at the R-I (analogue) stage, how do they interpret their clausal structures? Here, let us consider the structure in (32), repeated below in (35) again.

(35)

```
              vP
             /  \
           DP    vP
           |    /  \
         Hayley v    VP
               /    /  \
              v    V    DP
                   |    |
                 draw  boat
```

A child, even at this very early stage, must be sensitive to semantics. That is, it should be possible for a child to know that this expresses a proposition and to

interpret this {DP, *v*P} as consisting of a subject and a predicate. This sort of knowledge in fact seems indispensable in the acquisition of labeling of {XP, YP} structure. Take a tensed clause, {DP-NOM, TP}, in Japanese. A child must be aware that this expresses a tensed proposition, and not a DP, in order to figure out that a suffixal Case prevents the DP from "projecting" and as a result, TP provides the label for the structure.

Then, what about the "scrambled" structure in (33), repeated below in (36)?

(36)
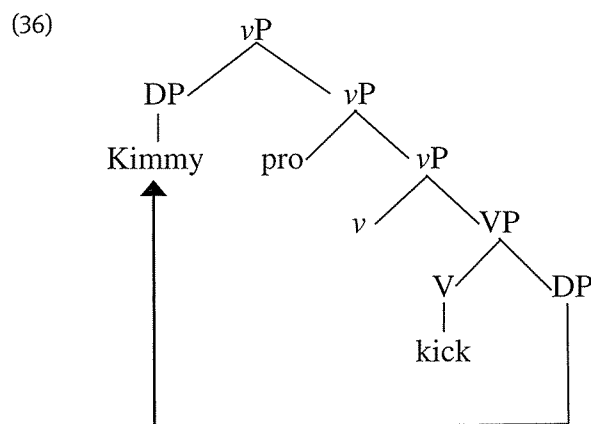
As a child is yet to discover how {XP, YP} structure is labeled, it is possible that s/he simply applies internal Merge in the structure. If so, the operation is indeed scrambling. Another possibility is that the structure is interpreted as topic-comment without being labeled, just like (35) is construed as subject-predicate. There is evidence that children are aware of discourse-sensitive relations at a very early stage. For example, the topic marker -*wa* in Japanese appears even at the R-I analogue stage, as shown in (37a). Further, sentence-final particles such as *ne* (asking for confirmation) and *yo* (assertion) are observed in this period, as shown already in (23a). More examples are provided in (37b) and (37c).

(37) a. otootyan-wa? (Sumihare 1;07)
      daddy TOP
      'What about Daddy? / Where is Daddy?'
   b. buuwa tuite nee nee (Sumihare 1;08)
      candle light SFP SFP
      'Please light the candle.'
   c. ippai ippai natta yo (Suminhare 1;10)
      full full became SFP
      'The bucket came to be filled with water.'

Then, it is conceivable that the internal Merge in (36) has discourse import.

It is beyond the scope of this paper to provide a precise hypothesis on how children interpret utterances at the R-I (analogue) stage. However, the general idea presented here on syntactic development should be clear. Children start out with the knowledge of predicate-argument structure and construct clauses accordingly, as proposed by Radford (1990). The *v*P clauses are not labeled in an adult way, and hence, the clauses are interpreted with this knowledge, possibly aided by knowledge on discourse as well. Then, children acquire how tensed propositions are labeled in her/his language on the basis of experience. This takes place with the appearance of Tense in the structure as a head, and the acquisition of ɸ-feature agreement or Case marking. Since this process heavily relies on experience, the labeling of {XP, YP} structure is where variation is found among languages. According to this hypothesis, children have not acquired the labeling of {XP, YP} structure at the R-I (analogue) stage, and a main part of the acquisition of syntax is to figure out the labeling of {XP, YP} structure in the given language.

5 Conclusion

In this paper, I considered early child grammar with respect to labeling. After briefly introducing Chomsky's (2013) Labeling Algorithm and Saito's (2016) proposal on labeling in Japanese in Section 2, I discussed acquisition data from R-I stage in English and R-I analogue stage in Japanese and Korean in Section 3. The R-I (analogue) utterances lack Tense and in Japanese and Korean, Case markers are also missing. I showed that it is unclear how the structures corresponding to those utterances are labeled if they are.

In Section 4, I suggested a hypothesis on the acquisition of syntax on the basis of the discussion in the preceding sections. The main idea is that children start with the knowledge of predicate-argument structure and produce utterances accordingly at the R-I (analogue) stage. Then, they acquire how clauses expressing tensed propositions are labeled in their languages. This involves the acquisition of ɸ-feature agreement in English and Case marking in Japanese/Korean. This fits well with Saito's (2016) proposal that the main parametric differences between English and Japanese can be attributed to the difference in the ways the two languages label the {XP, YP} structure.

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